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Individualism and the cultural roots of management practices

Abstract

We study the cultural foundations of management practices, which are increasingly recognized as important determinants of firm performance. This research closes the loop on two developing literatures, one seeking cultural explanations for economic development and the other seeking to account for differences in firm performance from differences in how firms are managed. Theoretically, we expect individualist culture to improve management practices because it formalizes the labor relation. Results show higher individualism is strongly associated with more sophisticated management practices. Several robustness checks confirm our findings and using historical presence of pathogens as an instrument affirms the causal effect of culture on management practices. In a direct test, culture is a much more important determinant of management practices than are key formal institutions. This evidence moves us forward in opening up the black box of culture-performance linkages, helping us to understand better the channels through which culture can affect economic prosperity.

1. Introduction

In a case study of the history of economic development, Clark (1987) found marked cross-country differences in productivity of nineteenth and early twentieth century cotton mills, even when the mills themselves used the exact same equipment. He traced back the cause of these differences to the way factories were managed. A contemporary study by Bloom and Van Reenen (2007, 2010) similarly documents substantial cross-country variation in management practices with important implications for firm performance: total factor productivity, return on capital, sales growth, survival, et cetera. These findings raise the question what can explain differences in quality of management practices across countries. One possible answer is culture, which is increasingly recognized as a cause of economic differences, as when economic activities take place in a certain context of social norms and other informal institutions (Harrison, 1992; Landes, 1998; North, 1990; Williamson, 2000). We draw on theories and insights from cross-cultural management studies to combine these two literatures with the aim of explaining differences in management quality, thereby illuminating a possible channel through which culture affects economic performance.

Early empirical analyses of culture's role in socio-economic outcomes were limited to showing region or country of origin effects, for instance in shirking behavior (Ichino and Maggi, 2000). Over the last few years, researchers have moved beyond such a reduced form approach, relying on simple survey items to measure country differences in cultural values (Guiso et al., 2006; Tabellini, 2008) and, more recently, using sophisticated indexes of comprehensive dimensions of national culture to explain differences in economic development (see, particularly, Gorodnichenko and Roland, 2011a, 2011b). The most significant of these dimensions is individualism, which various authors argue is a key factor in explaining economic differences (Greif, 1994, 2006; North, 2005; Platteau, 2000).

This paper takes the next step in opening the black box of firm performance and culture-performance linkages where we seek to understand the cultural roots of management practices. Theoretically, we expect increased individualism to go together with a formalization of the labor relation,

including objective performance appraisal criteria and more structured hiring and selection methods. To test this hypothesis, we draw on Bloom and Van Reenen's (2007, 2010) work that has developed a comprehensive indicator of differences in process-oriented features of management. We take our measure of individualism from Hofstede's (1980) seminal study, measuring and conceptualizing differences in national culture. Hofstede's (1980) study is among the most cited works in social science (Bond, 2002; Hofstede, 2001), but economists have only just started using his framework, not only to account for economic development, but also to explain country differences in economic phenomena more generally.¹ Confirming our hypothesis, results show that individualism is a strong determinant of management practices. This finding is robust to different model specifications. Instrumenting for individualist culture with a measure of historical pathogen prevalence affirms the causal influence of individualism on management practices. In an extension, we find that culture is a much more important determinant of the level of sophistication of management practices than are formal institutions. We find that looking at the cultural foundations of management practices indeed helps open the black box of culture-performance linkages, putting forward management quality as an important channel through which culture can affect economic performance.

2. Culture, management, and economic performance

2.1. Culture, individualism, and economic performance

The seminal work on culture and economic performance is Max Weber's (1904/5 [1930]) *The Protestant Ethic and the Spirit of Capitalism*, which investigated the idea of a specific Protestant work ethic

¹ Examples of phenomena influenced by national culture include investment strategies (Chui et al. 2010), patterns of industry growth (Huang 2008), and the impact of financial crises on investment (Inklaar and Yang 2012).

underlying the advent of modern capitalism. Following in Weber's footsteps, many authors have studied religious variation in work ethic, also linking such variation to economic prosperity (on the former, see Arruñada, 2010 and Guiso et al., 2003; on the latter, see McCleary and Barro, 2006 and Weil, 2009). Hofstede's (1980) influential work has paved the way for similar analyses using other cultural traits, not least individualism. Hofstede (1980, p. 260) defines culture as the "the collective programming of the mind which distinguishes the members of one group or category of people from another." This definition closely resembles Guiso et al.'s (2006, p. 23) definition of culture as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (see also Fernández, 2008). Individualism as a cultural value is defined as the extent to which individuals are supposed to take care of themselves (Hofstede, 1980; Gorodnichenko and Roland, 2011a, 2011b; Markus and Kitayama, 1991). Individualism concerns the most fundamental aspects of groups of people living and working together, making it a primary and perhaps the most important dimension of culture (see, also, Bond, 2002, Oyserman et al., 2002, and Triandis and Suh, 2002).

Psychologists have established links between individualism and such value dispositions as risk taking and, more generally, over-estimation of one's abilities (Lehman et al., 2004; Markus and Kitayama, 1991; Oyserman et al., 2002; Triandis and Suh, 2002). The culture-performance literature often relates individualist cultural values to autonomy, self-reliance, and personal freedom. Other work has extended this notion to include the pursuit of personal goals, achievement motivation and social recognition (e.g. Gorodnichenko and Roland, 2011a, 2011b). Tabellini (2008) considers individualism in relation to respect for other individuals and generalized morality (as opposed to morality that is limited to the in-group only and out-group hostility).

Individualism is typically viewed in opposition to collectivism, which is defined as the extent to which individuals remain integrated into groups (Hofstede, 1980; Markus and Kitayama, 1991). Whereas individualism is associated with value traits conducive to economic performance, collectivist values may hamper it. This effect would derive from an unwillingness to take risk, in-group favoritism, and conformity to group norms. Moreover, collectivism is often taken to provide disincentives for

entrepreneurship and other productive initiative taking, caused by collectivist norms on sharing material gains with in-group members (e.g. Lewis, 1955). On the other hand, different authors have traced the “miracle” development and growth experience of various Asian economies over the last few decades to their collectivist cultural heritage (e.g. Harrison, 1992; Redding, 1993). Particularly, collectivist values are thought to foster cooperation and lead to a stronger identification with one’s work group, i.e. a higher “team spirit” (see Chatman et al., 1998 and Wagner, 1995 for experimental evidence). More generally, too much individualism may be destructive as when it boils down to opportunistic behavior that goes at the expense of collective interests and undermines interpersonal trust (Banfield, 1958). An example is that in collectivist societies people prefer mediation to court settlement of disputes (Leung, 1997).

Empirically, the culture-performance literature finds a robust relationship between individualist cultural values and aggregate-level economic success (Franke et al., 1991; Gorodnichenko and Roland, 2011a, 2011b; Hofstede, 1980, 2001). The exact channels through which individualist culture affects economic performance remain under-researched, however. There is some evidence that individualism fosters innovative activity (Gorodnichenko and Roland, 2011a; Shane, 1993). Several studies have further linked individualism to entrepreneurship (Busenitz et al., 2000; McGrath et al., 1992; Mitchell et al., 2000), but the evidence remains ambiguous, as there is also much evidence that does not support such linkages (Morris et al., 1993, 1994; Thomas and Mueller, 2000; Tiessen, 1997). In light of this lack of clear evidence and the opposing theoretical effects of individualism on economic performance, this paper’s investigation into the cultural roots of management practices can be seen as an alternative route to understanding culture’s economic consequences. Although our chief interest is in explaining management practices, looking at the firm-level implications of individualist cultural values can help illuminate a potential channel through which culture affects economic development.

2.2. Management and economic performance

In their effort to understand economic development, economists are increasingly digging beyond the macro-level data on output per capita, considering industry differences and plant-level variation in productivity (Bartelsman and Doms, 2000; Harberger, 1998; Syverson, 2011). Detailed analyses reveal wide dispersion in productivity levels among firms, also within a given industry (Freeman and Shaw, 2009). To understand these differences, which tend to be persistent (Bailey et al., 1992; Foster et al., 2008; Fox and Smeets, 2011) and can be as large as a firm creating twice as much output with the same measured input (e.g. Syverson, 2004), we have to open another black box, that of firm heterogeneity. Particularly critical in the challenge to understand differences in productivity between firms is the way they are managed, specifically the practices that firms use in running their daily operations (Van Reenen, 2011).

Clark's (1987) historical examination of the performance and management of cotton mills fits in a longer literature following up on the idea that management matters, both for firms and for societies as a whole. The most notable example is probably Alfred Marshall's (1919) book *Industry and trade: A study of industrial technique and business organization ; and of their influences on the conditions of various classes and nations*. Similar in spirit to Clark's (1987) case analysis, a small set of empirical studies has statistically analyzed the extent to which specific human resource management (HRM) practices affect the performance of firms, particularly productivity. Ichniowski et al. (1997), for example, examine 36 uniform steel production lines from 17 different companies. Productivity regressions show that lines using novel HRM practices such as incentive pay and flexible job assignment are substantially more productive than lines managed in a more traditional fashion. Shearer (2004) reports experimental evidence for a tree planting company, finding that introducing piece rates increased productivity by about 20%. Other work looks at individual managers, demonstrating that personal management style (fixed managerial traits) matter for the behavior and success of a firm (Bertrand and Schoar, 2003).

Such insightful studies notwithstanding, there has been little systematic assessment of the role of management—different practices and procedures—in firm performance. The major obstacle has been the availability of high-quality data (Bloom et al., 2010; Syverson, 2011). An important advancement has

come with the work of Bloom and Van Reenen (2007, 2010), who initiated the World Management Survey (WMS) with the aim of collecting reliable, cross-country data on the way firms manage their daily operations. Mid-level plant managers of medium-sized manufacturing firms (100 to 5,000 employees) were interviewed over the telephone. To avoid results tainted by managers' desires and aspirations, the survey used open questions and the interviewees were not informed that the information would be used to score their company's management practices. Similarly, interviewers did not have knowledge on the performance of the firms they surveyed. The final database contains evaluations for 18 concrete management practices, covering all key domains of management, namely monitoring, targets management, and incentives management. The 18 practices together give a comprehensive index of overall quality of management practices. Results reveal marked cross-country differences in management practices with significant consequences for firm performance. Return on capital, growth and survival, as well as labor productivity, are higher in firms that are better managed as evidenced by more advanced and extensive monitoring, clearer and stricter output targets, and stronger incentive schemes in HRM decisions such as pay and promotion. The empirical analysis in this paper also uses WMS data and we discuss the WMS index of management practices in more detail in the next section.

Well-documented variation in firm-level performance together with the mounting evidence on the role of management therein, strongly supports the idea that differences in management practices play a role in global economic disparities (cf. Clark, 1987; Marshall, 1919).² Their impact can be substantial. In an insightful study, Hsieh and Klenow (2009) create a counterfactual, estimating that if Chinese and Indian manufacturing plants were to allocate their resources as efficiently as U.S. plants, TFP in this sector would increase by 30-50% in China and 40-60% in India.

2.3. Individualism and cultural differences in management practices

² Different studies show that productivity growth within firms accounts for almost all aggregate-level productivity growth (e.g. Van Biesebroeck 2008).

The substantial performance effects of management practices, both for the firm itself and for society as a whole, raise the question what factors can account for differences in management practices. Most evidence to date concerns variation within countries. Bloom and Van Reenen (2007, 2010) uncover a variety of factors predicting differences in management practices, including firm size and ownership type, especially whether a firm is family-owned or not. Less is known about aggregate-level determinants of management practices, although different levels of firm decentralization and CEO span of control have been linked to product market competition (Acemoglu et al., 2007; Bloom, Genakos et al., 2012). A key question concerns the role of culture in explaining different management practices and organizational forms (Van Reenen, 2011). Initial results show that trust and religion are determinants of decentralization (Bloom et al., 2012), but little is known about distinct cultural influences on how firms manage their operations.

In cross-cultural management we can initially find the same view on culture as in economics: the managing of firms and business activity more generally takes place in a context of formal and informal institutions, the so-called rules of the game (cf. North, 1990; Williamson, 2000). Cross-cultural management goes one step further, however, finding that “organizations are culture-bound,” as Hofstede (2001, p. 378) puts it. Early work in cross-cultural management sought to compare management styles, particularly in the US and Europe (Harbison and Myers, 1959; Haire et al., 1966). From thereon, the idea that culture matters for management practices has ventured into different areas of business and management studies.

A vibrant field is so-called cross-cultural organizational behavior (OB), which breaks down in three areas, micro, meso and macro, depending on the level of analysis (Bond and Smith, 1996; Gelfand et al., 2007; Tsui et al., 2007). Themes in this literature include individuals’ motives and cognitions (micro OB), leadership and negotiation (meso OB) and organizational culture (macro OB). Most germane to understanding the influence of individualism on management practices is the body of (experimental and theoretical) work in cross-cultural OB that relates individualist cultural values to micro and meso

organizational phenomena. Culture matters for preferences (Fernández, 2008; Guiso et al., 2006) and drawing on cross-cultural OB we find that individualism is associated with preferences conducive to a formalization of the labor relation, making it transactional in nature instead of an in-group phenomenon that is shaped by relational ties.

To start, a robust finding in cross-cultural OB is that different levels of individualism are associated with different preferences for reward allocation. Lower individualism, for instance, decreases preferences for individual-based pay and pay-for-performance (Cable and Judge, 1994; Schuler and Rogovsky, 1998) and goes together with greater focus on prevention (avoidance of losses) than on promotion (pursuit of gains) (Lee et al., 2000). Along similar lines, there is much evidence that individualist societies care less about equality of rewards (e.g. Wade-Benzoni et al., 2002) and let merit play a larger role in reward allocation decisions than collectivist societies do (e.g. Ramamoorthy and Carroll, 1998).

Hofstede et al. (2010) provide a brief synopsis, finding that in cultures low on individualism, employees are members of in-groups pursuing in-group interests and management is about the management of groups (Hofstede et al., 2010, p. 124). In individualistic cultures, employees only pursue the firm's interests if it coincides with their own interests and management concerns management of individuals. The latter makes that the effectiveness of individual-level monitoring is higher in individualist cultures (Earley, 1989, 1993). Practically, hiring and promotion decisions may be largely based on skills and rules (high individualism) or take employees' in-group (i.e. group affiliation) into account (low individualism) (see, for example, Kim et al., 1990). In addition, internal recruitment tends to be more (less) likely and jobs announced through narrower (broader) channels in societies low (high) on individualism (cf. Budhwar and Khatri, 2001; Lee, 1998).

A further view is that high-individualism societies tend to view the evaluating of subordinates as a way to increase productivity, whilst low-individualism societies find it disrupts harmony (Hofstede, 2001, p. 244-245; Lee et al., 2000). The latter may go so far as to dislike high-performers and monitoring as the former invokes envy and both may create disharmony (Kovach, 1994; cf. Hempel, 2001). As

mentioned earlier, low individualism goes together with more mediation (Leung, 1997), and this finding may extend towards performance appraisals, which are then done by consensus and do not involve explicit evaluation of individuals. In Hofstede's terminology, a higher level of individualism "economizes" the employer-employee relation, changing it from a family-like connection to a true contract between the demand side and the supply side on a labor market (Hofstede, 2001; Hofstede et al., 2010). More generally, in individualist societies, performance appraisal occurs more by objective criteria rather than subjective criteria or soft factors such as employee loyalty (Moran et al., 2011; cf. Chen, 2004).

We suggest that individualism actually does more than merely economize the labor relation. We find that it adds a level of formalization and structure to the practices that firms rely on for managing their operations. This holds particularly for the aspects of firms' day-to-day operations that directly involve employee behavior, also introducing standardization of procedures and moving away from impromptu HRM decisions. We therefore propose that individualism leads to higher quality management practices. We find the effect of individualism on management practices is most evident in two of the three main domains of management, namely the managing of incentives and the managing of targets. In these areas, individualism is not only associated with stronger incentive schemes but also with clearer and stricter targets that can form the basis for individual performance appraisals and promotion decisions. Individualism's influence is generic, however, extending to all basic management practices and thereby improving overall management quality. Overall, the hypothesis that we test in the next section is that individualism has a positive effect on management, raising the level of practices firms use to manage their operations.

3. Empirical strategy

3.1. Description of the data

3.1.1. Management practices

Our dependent variable is an indicator of a firm's overall quality of management. 18 separate practice scores are combined in a comprehensive indicator of the level of sophistication of a firm's management practices. The practices all concern process-oriented features of management and day-to-day operations, and not strategic issues such as pricing or mergers and acquisitions. Data come from the WMS.³

The way the WMS has gone about collecting accurate measures of management practices deserves some elaboration. As mentioned above, the 18 scores, and hence the overall rating of management quality, are obtained using an open interview technique. Answers to open questions such as “Tell me how you monitor your production process” (Bloom and Van Reenen, 2010, p. 207), and follow-up questions eliciting more detailed information, are used to evaluate the firm's score on a particular management practice. Key in this method is the scoring grid. The WMS uses an interview-based evaluation tool in which firms are assigned scores from 1 to 5 on each of the 18 practices, based on the level of sophistication with which they apply the particular process or procedure. An illustrative example of assigning scores evaluating the level of sophistication of a management practice is the practice of *process problem documentation* (Bloom and Van Reenen, 2007, p. 1397).⁴ A score of 1 is assigned if no

³ For more information see <http://www.worldmanagementsurvey.com>. This website also has the firm-level data used for this paper—as described in Bloom and Van Reenen 2010—available for downloading. Our description of the WMS data is from Bloom and Van Reenen (2007, 2010).

⁴ The other 17 basic practice measures concern the following issues: *introduction of modern manufacturing techniques*, *the rationale for the introduction of modern manufacturing techniques*, *performance tracking*, *performance review*, and *performance dialogue* (all monitoring practices); *target balance*, *target interconnection*, *target time horizon*, *targets are stretching*, and *performance clarity* (all targets management practices); and *consequence management*, *rewarding high performance*, *removing poor performers*, *promoting high performers*, *attracting human capital*, and *retaining human capital* (all incentives management practices).

process improvements are made when problems occur. A firm receives a score of 3 if improvements are made in weekly workshops involving all staff so as to improve performance in their area of the plant. Finally, if exposing problems in a structured way is integral to individuals' responsibilities and resolution occurs as part of normal business processes rather than by extraordinary effort/teams, the firm is evaluated with a 5 on the practice of process problem documentation.

The 18 measures together comprehensively show how firms manage their operations. More importantly, the composite indicator is a valid and reliable indicator of the quality of management practices. As mentioned, measured quality of management correlates with key aspects of firms' performance, including labor productivity, total factor productivity, return on capital, growth and survival. In addition, resurveying selected firms using mostly different plants replicated the original evaluation of management quality to a large extent. In a sample of 64 firms, the correlation between these two independent assessments of management practices equaled 0.734 (Bloom and Van Reenen, 2007, pp. 1365-1366). This high test-retest correlation shows that the management quality measure is able to capture genuine variation in management practices across firms.

<< Insert Table 1 about here >>

For the empirical analysis we use only firms with non-missing observations on all basic practice measures. In addition, we have a main sample limited to purely domestic firms that we use throughout. An enlarged sample that also includes domestic and foreign multinationals is used to check the robustness of our findings. Table 1 gives descriptive statistics for our dependent variable. Country mean scores on the overall measure of management quality vary from a low of 2.51 (Greece) to a high of 3.25 (US). The best managed firm resides in the US and has a management score of 4.88, whilst the most poorly managed firm in our sample is from India and has a management quality score of 1, all on a scale from 1 to 5.

3.1.2. Culture, formal institutions, and other independent variables

Our measure of individualist culture comes from Hofstede (1980), as also used by Gorodnichenko and Roland (2011a, 2011b). Hofstede's measure derives from answers given in IBM's international employee attitude survey program in the late 1960s and early 1970s. Two survey rounds rendered approximately 116,000 questionnaires from 72 countries (Hofstede, 2001). Surveying people from the same company and at comparable positions, Hofstede was able to single out country-specific differences in values. He applied factor analysis to aggregated individual responses to identify different dimensions of national culture, with individualism/collectivism being the most prominent one.

Using all available country scores, we are able to match Hofstede's measure of individualism to 16 out of 17 countries in the WMS sample. Following the idea that countries' culture scores only make sense relative to other countries' scores, Hofstede originally intended his index to be on a scale from 0 to 100. Actual individualism scores range from 6 (Guatemala, most collectivist) to 91 (US, most individualist). As shown in Table A.1, the 16 countries included in our sample cover almost the complete range of cultural differences.⁵

A possible threat to the validity of our findings concerns a drawback of Hofstede's culture measure, namely its potential entanglement of formal institutional arrangements and other social circumstances with genuine differences in national culture and individualist cultural values. Research has shown that culture measures based on values questionnaires—of which Hofstede's (1980) framework is the most famous example—can have difficulty distinguishing cultural variation in values, variation genuinely due to shared programming of the mind, from variation in values due to the socio-economic and institutional environment at the time of the interviews (Clarke et al., 1999; Davis et al., 1999; Maseland and Van Hoorn, 2010). This issue initially constitutes a problem of measurement but it can indirectly result in an endogeneity problem. The chain would be as follows. First, a firm's management

⁵ Individualism/collectivism scores are publicly available from Geert Hofstede's only official website, <http://www.geerthofstede.nl> (retrieved on 2012-01-06).

practices affect the performance of the firm. Second, firm performance influences aspects of macro-level circumstances. Third, these macro-level circumstances influence measured cultural values. Clearly, the theoretical rationale for an endogeneity problem is limited, but nevertheless we apply a variety of robustness checks to ensure the causal effect of individualism on quality of management.

Our main approach to addressing the potential endogeneity problem is the use of an established, evolutionary instrument for individualist/collectivist cultural values. As in Chui et al. (2010), we further use an alternative measure of individualism recently developed by House et al. (2004), called in-group collectivism, which has been argued to overcome the above-mentioned weakness of Hofstede's (1980) individualism index. Finally, we run several analyses extending our basic models to include an explicit role for formal institutions. This latter approach, estimating extended models, has the added benefit that we can gauge the importance of culture vis-à-vis formal institutions for the way firms are managed.

Recent advances in behavioral ecology and sociobiology, have established an evolutionary foundation for cross-national differences in individualism/collectivism. Acting as a an evolved mechanism by which to maximize survival, societies are less open to new experience and out-group contacts or foreigners, value conformity and tradition higher, and are more strict about adherence to social norms in geographic areas in which pathogenic diseases used to be relatively more prevalent (see, for example, Fincher et al., 2008 and Murray and Schaller, 2010). The idea is that in such regions, collectivistic culture—which is opposed to individualistic culture—is selected for because its behavioral manifestations serve an anti-pathogen defense function, helping to prevent coming into contact with novel pathogens. We draw on the theoretical idea of culture as a group trait that has evolved from historical times and use the index of historical pathogen prevalence developed by Fincher et al. (2008) to instrument for individualist cultural value traits. This index comprises epidemiological data for a set of nine pathogens particularly detrimental to human reproductive fitness, including malaria, leprosy, typhus and tuberculosis. The correlation between Fincher et al.'s (2008) index of historical pathogen prevalence and Hofstede's (1980) measure of individualism is -0.774.

House et al. (2004) report on the GLOBE study, which is a large-scale project involving some 200 researchers, aiming to extend and improve on Hofstede's (1980) framework of cultural dimensions. Their set of measures does not include individualism, capturing the relevant dimension of national culture as in-group collectivism instead, which again is the opposite of individualism. Compared to Hofstede (1980), the GLOBE study appears less prone to suffer the problem of potentially mixing up genuine differences in culture with differences that are not cultural but due to differences in the national circumstances faced by respondents answering to Hofstede's survey items (cf. Maseland and Van Hoorn, 2009). The reason is that the in-group collectivism measure is based on reported cultural practices rather than on answers to values items as in Hofstede's study (ibidem). The correlation between House et al.'s (2004) measure of collectivism and Hofstede's (1980) original index equals -0.757, where the minus sign reflects that the GLOBE index measures collectivism instead of individualism.

The indicators of institutional differences that we use to separate culture's influence on management practices from that of formal institutions concern legal origin and variety of capitalism. These dummy variables are comprehensive indicators of key institutional differences widely shown to have important economic consequences (La Porta et al., 2008; Hall and Soskice, 2001). If the effect of Hofstede's measure of individualism on quality of management indeed derives from country differences in formal institutions, the effect of individualism should disappear once differences in institutional environment are controlled for. Our use of dummy variables indicating legal origin (UK law, French law, or other) and variety of capitalism (Liberal Market Economy, Coordinated Market Economy, or other; Hall and Soskice, 2001) is deliberate as they capture a wide spectrum of institutional arrangements potentially affecting the way firms manage their day-to-day operations. The broad scope of these variables can also be seen as a drawback, however, and therefore we also estimate models using narrow measures of institutions thought to be most relevant for management practices. Specifically we look at labor regulations, as studied by Botero et al. (2004). The measures that we use are the index of dismissal and the overall index of labor regulation constructed in the Botero et al. (2004) study. Table A.1 gives descriptives for these institutional variables and all other country-level variables.

Next to country-level independent variables, the analyses include a set of standard, firm-level control variables. Some of the early work using WMS data has found a number of firm characteristics to be important predictors of management practices. We include the most important of these as controls, namely firm size and firm ownership. We add firm type as a control when applicable. Firm size is a continuous variable, and in our models we include both a linear and a quadratic term. The ownership and firm-type variables are categorical variables, which we recode into dummies with one category designated as base category. The WMS also contains data on the sector in which the firm is active (four-digit SIC), allowing us to control for sector fixed effects. To ensure that we have a representative number of observations per sector, we use a less fine-grained sector definition, recoding the original variable to a two-digit sectoral classification. Firms with missing SICs have been assigned a separate two-digit code and are added to the sample. Firms operate in 28 different sectors and in 278 unique country sectors, meaning there are about 17 different sectors in each of the countries. Table 1 includes descriptive statistics for the firm-level variables. After dropping firms with missing data, the main sample comprises 2,955 firms. The enlarged sample, additionally including firms that are not purely domestic (i.e. multinationals), comprises 5,228 firms.

3.2. Method

The data on management practices concern firms nested in countries, which means that observations are clustered, and we control for this in our analysis. Controlling for clustering alone is not enough, however, as the hierarchical nature of the data also means that traditional OLS analysis throws together predictors that operate different levels. To avoid such mix up, we apply a technique that allows us to separate within-country variation and between-country variation and estimate models for firm-level variables and country-level variables simultaneously.

For the formal empirical model we have a firm i residing in country j . We let MP_{ij} denote the firm's score on the management practices measure. The independent variable of interest is individualism in the country in which the firm is located. We denote countries' level of individualism simply by IDV_j . We also include x_{ij} , a set of firm-level control variables. The basic empirical model is then given by:

$$MP_{ij} = \gamma_{00} + \gamma_{01}IDV_j + \beta_1 x_{ij} + (u_{0j} + e_{ij}), \quad (1)$$

where e_{ij} is a random, firm-level error term, γ_{00} is the mean (intercept) that is fixed over all countries, and u_{0j} is a random, country-level error term. The latter term captures country fixed effects, specifically any unobserved country-specific factors affecting firms' management practices. For our main empirical analysis, we extend the basic model to include sector fixed effects at the two-digit SIC level, also controlling for clustering within sectors. All models are estimated using maximum likelihood procedures.

4. Results

Model 1 in Table 2 is our most basic model, including only the standard set of firm-level controls. Results are in line with prior research (Bloom, Genakos et al., 2012). Model 2 shows that additionally controlling for sector-specific effects improves model fit statistically significantly (the test-statistic for the Chi-square test equals 21.9 at one degree of freedom⁶). Hence, this model is our preferred baseline model. The data confirm our hypothesis concerning the effect of individualism on firms' management practices. Entering

⁶ Reported results typically concern the same samples so that likelihood ratios can be used to test whether model fit has improved statistically significantly at usual levels.

individualism directly (Model 3) or with an extensive set of firm-level control variables (Model 4) we find a strong, positive and highly statistically significant relationship between individualism and quality of management practices. The size of the effect is such that moving from the lowest individualism score in the sample (20, China) to the highest (91, US), increases the overall level of sophistication of firms' management practices by 0.47 points ($.71 \times .664$) or 0.73 standard deviations ($.47 / .648$), keeping everything else constant. In terms of explanatory power, we find that individualism alone explains about 5.5% of total variation (Model 3), which is slightly less than half of total variance explained by the complete model (Model 4).

<< Insert Table 2 about here >>

5. Robustness and extensions

Table 3 reports results for several robustness checks. First, we find the same strong, positive relationship between individualism and management quality when we instrument culture with historical pathogen prevalence (Model 5). Although there is little theoretical reason to assume that a firm's management practices will affect a country's level of individualism, this result affirms culture's causal effect on management practices. Excluding firms from Great Britain does not change this result (Model 7). As typically expected, statistical fit is lower in case of the IV estimate, with variance explained reduced by between 0.9 to 1.3 percentage points. We also find, however, that for the IV models estimated coefficients are slightly higher (Model 4 vs. Model 5 and Model 6 vs. Model 7). All these results are unaffected when using Murray and Schaller's (2010) index of historical pathogen prevalence, which expands the geographical scope of Fincher et al.'s (2008) original index of historical pathogen prevalence and thereby has slightly different country scores (results available on request).

<< Insert Table 3 about here >>

A possible limitation of our analysis is that it concerns only domestic firms. We initially limited the sample to domestic firms because the management practices of multinational firms are strictly speaking not tied to a single national culture. Nevertheless, to obtain broader evidence on the effect of individualism on management quality, we have also analyzed the effect of individualism in an enlarged sample that additionally includes foreign and domestic multinationals for a total of 5,228 firms. If national culture, specifically individualism, affects management practices, we expect a weaker relationship between individualism and quality of management in this sample. The reason is that management practices in multinational companies are likely influenced by several cultures simultaneously. This prediction is borne out by the data (Models 8-13), providing some further confirmation of the idea that national culture affects how firms manage their day-to-day operations. Variance explained is higher, but this is because type of firm (foreign multinational, domestic multinational or domestic firm), which we have added as a firm-level control variable, itself is a powerful determinant of management practices (also see the descriptives in Table 1, showing the higher mean management quality in the enlarged sample relative to the main sample). Concerning robustness, we find that even in the enlarged sample, individualism remains a powerful determinant of the way firms are managed, lending additional credence to our initial findings.

The robustness of our findings is strengthened further by the results for the regressions that use House et al.'s (2004) alternative measure of collectivist/individualist culture (Table A.2 in the appendix). In fact, the (negative) relationship between individualism/collectivism and the quality of management is stronger than before and the amount of variance explained higher. From all these robustness checks, we conclude that individualism exerts a robust and sizeable influence on the quality of management practices. One caveat is still in order, however.

<< Insert Table 4 about here >>

Whilst using pathogen prevalence as an instrument identifies individualism's causal influence on management practices, so far we have not addressed the important question of the role of formal institutions in explaining management quality. Results for models including institutional control variables (Table 4) show the importance of formal institutions for management practices. Firms from coordinated market economies (CMEs), for instance, appear better managed on average.⁷ Key finding, however, is that with formal institutions controlled for, the effect of individualism remains strong and highly statistically significant (Models 14 and 15). This result extends to the enlarged sample (Models 17 and 18) and, more importantly, to models that include multiple measures of formal institutions simultaneously (Models 16 and 19). Note though that these latter models are not our preferred models as the institutional variables used partly capture the same kind of institutional differences between countries, potentially resulting in multicollinearity issues. Meanwhile, using specific measures of labor regulations instead of the comprehensive institutional indicators used so far, also shows the importance of individualism in explaining firm differences in management practices, whilst—in line with Bloom, Genakos et al. (2012)—labor regulations themselves do not affect management quality (Table A.3 in the appendix).

Our conclusion is that whilst formal institutions exert some influence on the level of sophistication by which firms are managed, culture, specifically individualism, is a far more important determinant of management practices. This conclusion is in line with work finding the supremacy of culture over institutions in accounting for economic development (e.g. Gorodnichenko, 2011a).

6. Discussion and conclusion

⁷ Perhaps surprising at first, this result is fully in line with Hall and Soskice's (2001) finding that liberal market economies (LMEs) have a comparative institutional advantage in services, whilst CMEs have a comparative advantage in manufacturing.

Economists are increasingly researching firms and firm-level productivity as a means to understand aggregate-level productivity differences, in turn essential to economic development. Mounting evidence shows that management practices can be critical, significantly affecting such aspects of firm performance as return on capital, labor productivity, total factor productivity and sales growth. The suggested next step in opening up the black box of differences in economic performance is to understand the sources of differences in the level of sophistication of the way firms are managed.

In this paper we have empirically analyzed individualist culture as a potential determinant of management quality. This empirical investigation into the cultural roots of management practices fits another developing literature in economics that studies culture's economic consequences, particularly its effect on development and growth. The latest development in cultural economics is to move beyond reduced-form approaches, and our analysis also looks at a distinct cultural trait to see how it shapes economic activity. Individualism has been established as an important factor in economic development, first theoretically but, more recently, also empirically. We hypothesize that individualism fosters the formalization of the labor relation. The result is an overall improvement in quality of management practices as the formalization takes shape through more advanced and extensive monitoring, clearer and stricter targets, and stronger incentive schemes in HRM decisions.

We test the effect of individualism on the level of sophistication by which firms manage their day-to-day operations in a unique data set comprising as much as 5,000 firms. Results show that more individualistic cultural values are indeed positively related to the quality of management practices. This effect is robust to different model specifications. In addition, IV estimates affirm individualism's causal effect on the quality of management practices. In a direct test, culture turns up as the main determinant of management practices, more important than formal institutions. Overall conclusion is that individualism exerts a robust and sizeable influence on the quality of management, which, in turn, suggests that management practices are a potentially important channel through which individualism affects economic performance.

Our extensive use of robustness checks, including a variety of alternative independent variables, notwithstanding, the empirical analysis in this paper suffers some limitations brought on by practicalities. Although our sample includes firms from countries spanning almost the complete range of high and low individualism countries, the actual number of countries included is not very high. The fewer the number of countries in the sample, the fewer the number of country variables that can reasonably be included in an empirical model. Correspondingly, our study has analyzed only one feature of national culture. Although individualism is a most important cultural trait, there are various established frameworks of country differences in culture and these all identify a number of dimensions on which cultures differ. Future research may analyze other dimensions of countries' culture, next to individualism, that potentially affect how firms manage their day-to-day operations.

Beyond the study of the cultural roots of management practices, an important additional direction for future research concerns explicit investigation of the role of management practices in the culture-performance nexus. This paper has focused on analyzing culture as a determinant of management quality, with the cultural roots of economic development lurking in the background. Follow-up research can provide a more explicit analysis of management practices as a potential channel through which culture affects economic performance. For such studies, data availability will also be a constraining factor, determining what can be researched and what not. We note, however, that understanding firm differences in productivity remains crucial to explaining economic performance, and that management practices offer much scope for contributing to this most vital of all puzzles in economics.

Appendix

<< Insert Table A.1 about here >>

<< Insert Table A.2 about here >>

<< Insert Table A.3 about here >>

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Table 1

Descriptive statistics for dependent variable and other firm-level variables.

	Mean and standard deviation	
	Main sample, purely domestic firms only (n=2,955)	Enlarged sample, including multinational firms (n=5,228)
Dependent variable		
Management quality (1-5)	2.78 (.648)	2.97 (.671)
Firm-level independent variables		
Ownership		
Government [Base category]	.033 (.178)	.024 (.152)
Dispersed shareholders (five or more)	.161 (.368)	.318 (.466)
Family with family CEO	.235 (.424)	.176 (.381)
Family with external CEO	.035 (.183)	.040 (.197)
Private individuals	.186 (.389)	.160 (.367)
Founder	.262 (.440)	.169 (.374)
Managers	.039 (.193)	.030 (.170)
Private equity	.009 (.097)	.025 (.156)
Other	.038 (.192)	.057 (.231)
Unknown ownership	.002 (.049)	.002 (.044)
Type of firm		
Purely domestic firm [Base category]	1	.565 (.496)
Foreign multinational	0	.246 (.430)
Domestic multinational	0	.189 (.392)
Firm size (Number of employees)	581 (788)	715 (936)

Notes: Standard deviations in parentheses. Firms with missing data on the management quality measure have been dropped. Of some firms the ownership type could not be established ("Unknown ownership"). Firms operate in 28 (29) different sectors and in 278 (307) unique country sectors.

Table 2

Individualism and other determinants of management practices.

Dependent = Management quality (1-5)	Model 1	Model 2	Model 3	Model 4
Intercept	2.44*** (.084)	2.42*** (.084)	2.42*** (.119)	2.02*** (.129)
Individualism	-	-	.654*** (.184)	.664*** (.175)
Ownership				
Dispersed shareholders	.359*** (.067)	.367*** (.067)	-	.366*** (.067)
Family with family CEO	.169** (.068)	.180*** (.068)	-	.178*** (.068)
Family with external CEO	.335*** (.087)	.351*** (.087)	-	.350*** (.087)
Private individuals	.277*** (.067)	.285*** (.067)	-	.281*** (.067)
Founder	.161** (.067)	.183*** (.067)	-	.180*** (.067)
Managers	.456*** (.086)	.462*** (.086)	-	.456*** (.085)
Private equity	.434*** (.129)	.420*** (.128)	-	.415*** (.128)
Other	.245*** (.084)	.260*** (.084)	-	.254*** (.084)
Unknown ownership	.256 (.230)	.236 (.228)	-	.237 (.228)
Firm size	.405*** (.041)	.410*** (.041)	-	.411*** (.041)
Firm size squared	-.074*** (.010)	-.075*** (.010)	-	-.076*** (.010)
Sector fixed effects	No	Yes	Yes	Yes
-2Loglikelihood	5,248.9	5,227.0	5,442.9	5,217.1
Pseudo R ²	7.1%	7.1%	5.4%	12.7%

Notes: See Tables 1 and A.1. Standard errors in parentheses. Clustering at the country level is taken into account. Models with sector fixed effects additionally take clustering at the sector level into account. All models include country fixed effects. *, ** and *** denotes significance at the 0.1, 0.05 and 0.01 level respectively. Individualism (with scores ranging from 20 to 91 on a 0-100 scale) is divided by 100. Firms owned by the government are base category. Firm size (number of employees) is divided by 1,000 and firm size squared by 1,000,000. Data concern 2,955 firms from 16 countries. Sector fixed effects concern 278 unique country sectors. For calculation of pseudo R²'s, total variance of the empty model is calculated as the sum of firm-level variance, between-country variance and, if applicable, variance between country sectors.

Table 3

Robustness of individualism's effect on management practices.

	Enlarged sample, including multinationals								
	Model 5	Without Great Britain		Model 8	Model 9	Model 10	Model 11	Without Great Britain	
		Model 6	Model 7					Model 12	Model 13
IV estimate	Yes	No	Yes	No	No	No	Yes	No	Yes
Intercept	2.39*** (.077)	1.98*** (.124)	2.40*** (.077)	2.52*** (.106)	2.52** (.071)	2.21** (.112)	2.50*** (.066)	2.18*** (.108)	2.51*** (.066)
Individualism	.784*** (.240)	.758*** (.174)	.905*** (.255)	.733*** (.163)	-	.510*** (.151)	.608*** (.202)	.588*** (.149)	.706*** (.212)
Firm-level controls	Standard set	Standard set	Standard set	No	Standard + firm type	Standard + firm type	Standard + firm type	Standard + firm type	Standard + firm type
No. of firms	2,955	2,659	2,659	5,228	5,228	5,228	5,228	4,521	4,521
No. of country sectors	278	259	259	307	307	307	307	287	287
-2Loglikelihood	5,219.1	4,647.7	4,650.43	9,906.4	9,254.0	9,245.7	9,247.1	7,912.0	7,914.2
Pseudo R ²	11.8%	14.3%	13.0%	6.0%	15.1%	18.1%	17.7%	19.6%	19.0%

Notes: See Table 2. Clustering at both the country and the sector level is taken into account. All models include country and sector fixed effects. IV: using historical pathogen prevalence to predict individualism and use this predicted value in the empirical model. Base category for the enlarged sample is a fully domestic firm owned by the government.

Table 4

The effect of culture and formal institutions on management practices.

	Model 14	Model 15	Model 16	Enlarged sample, including multinationals		
				Model 17	Model 18	Model 19
Intercept	1.98*** (.123)	1.91*** (.108)	1.89*** (.111)	2.16*** (.115)	2.14*** (.106)	2.09*** (.110)
Individualism	.942*** (.179)	.808*** (.181)	.793*** (.180)	.715*** (.167)	.608*** (.182)	.567*** (.176)
Legal origin						
UK law	-.266*** (.091)	-	-.036 (.114)	-.176* (.084)	-	-.004 (.121)
French law	-.109 (.083)	-	.060 (.085)	-.036 (.076)	-	.108 (.086)
Type of welfare state						
LME	-	-.083 (.093)	-.011 (.120)	-	-.062 (.092)	.024 (.125)
CME	-	.285*** (.081)	.316*** (.102)	-	.184** (.079)	.255** (.101)
Firm-level controls	Standard set	Standard set	Standard set	Standard + firm type	Standard + firm type	Standard + firm type
No. of firms	2,955	2,955	2,955	5,228	5,228	5,228
No. of country sectors	278	278	278	307	307	307
-2Loglikelihood	5,210.0	5,202.9	5,201.8	9,241.6	9,238.1	9,236.0
Pseudo R ²	14.6%	15.9%	16.1%	19.0%	19.6%	19.9%

Notes: See Table 3.

Table A.1

Country-level independent variables.

Country	Individualism	Historical pathogen prevalence	Mean management quality, enlarged sample	UK law	French law	Liberal Market Economy (LME)	Coordinated Market Economy (CME)	Collectivism	Labor dismissal index	Index of labor regulation
Australia	90	-.200	3.04	1	0	1	0	4.14	.143	.351
Brazil	38	1.02	2.70	0	1	0	0	5.16	.571	.568
Canada	80	-1.29	3.14	1	0	1	0	4.22	.286	.262
China	20	1.00	2.63	0	0	0	0	5.86	.429	.432
France	71	-.510	3.06	0	1	0	0	4.66	.857	.744
Germany	67	-.930	3.22	0	0	0	1	4.27	.571	.702
Great Britain	89	-.960	3.00	1	0	1	0	4.08	.143	.282
Greece	35	.150	2.76	0	1	0	0	5.28	.286	.519
India	48	.900	2.69	1	0	0	0	5.81	.857	.443
Ireland	70	-.390	2.84	1	0	1	0	5.12	.286	.343
Italy	76	.220	3.14	0	1	0	0	4.99	.429	.650
Japan	46	.510	3.19	0	0	0	1	4.72	.000	.164
Poland	60	-.800	2.89	0	0	0	0	5.55	.571	.640
Portugal	27	.560	2.83	0	1	0	0	5.64	.714	.809
Sweden	71	-.930	3.24	0	0	0	1	3.46	.714	.740
United States	91	-.860	3.35	1	0	1	0	4.22	.143	.218

Notes: Countries that are neither a Liberal Market Economy (LME) nor a Coordinated Market Economy (CME) are base category in the analyses. Similarly, the base category for legal system is neither a UK nor a French legal system. Collectivism scores for Germany and Canada are calculated as weighted averages of scores for East and West Germany and for French- and English-speaking Canada respectively. Most data sets do not contain separate scores for Great Britain, so we used those for the UK instead. Part of our robustness checks involves estimating our empirical models with these countries excluded.

Table A.2

The effect of collectivism on management practices.

	Model A.1	Enlarged sample Model A.2	Without Canada, Germany and Great Britain	
			Model A.3	Enlarged sample Model A.4
Intercept	3.61*** (.260)	3.38*** (.231)	3.80*** (.279)	3.48*** (.251)
Collectivism	-2.46*** (.510)	-1.78*** (.458)	-2.81*** (.538)	-1.95*** (.490)
Firm-level controls	Standard set	Standard + firm type	Standard set	Standard + firm type
No. of firms	2,955	5,228	2,483	4,196
No. of country sectors	278	307	239	267
-2Loglikelihood	5,212.7	9,243.6	4,335.6	7,358.4
Pseudo R ²	13.9%	18.5%	15.8%	19.6%

Notes: See Table 3.

Table A.3

Robustness: Individualism, labor regulation, and management practices.

	Enlarged sample, including multinationals							
	Model A.5	Model A.6	Without Great Britain		Model A.9	Model A.10	Without Great Britain	
			Model A.7	Model A.8			Model A.11	Model A.12
Intercept	2.04*** (.169)	1.95*** (.186)	2.03*** (.157)	1.94*** (.177)	2.25*** (.145)	2.18*** (.160)	2.25*** (.135)	2.18*** (.151)
Individualism	.648*** (.186)	.692*** (.183)	.730*** (.177)	.771*** (.179)	.488*** (.160)	.525*** (.158)	.558*** (.151)	.590*** (.153)
Labor dismissal index	-.040 (.162)	-	-.090 (.153)	-	-.057 (.137)	-	-.102 (.129)	-
Labor regulation index	-	.103 (.207)	-	.058 (.199)	-	.055 (.175)	-	.008 (.168)
Firm-level controls	Standard set	Standard set	Standard set	Standard set	Standard + firm type	Standard + firm type	Standard + firm type	Standard + firm type
No. of firms	2,955	2,955	2,659	2,659	5,228	5,228	4,521	4,521
No. of country sectors	278	278	259	259	307	307	287	287
-2Loglikelihood	5,217.1	5,216.9	4,647.3	4,647.6	9,245.5	9,245.6	7,911.4	7,912.0
Pseudo R ²	12.7%	12.7%	14.5%	14.3%	18.1%	18.1%	19.7%	19.6%

Notes: See Table 3.



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